

## Anterior Esthetic Gingival Depigmentation and Crown Lengthening: Report of a Case

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### Abstract

Excessive gingival display space and gingival hyperpigmentation are major concerns for a large number of patients visiting the dentist. Melanin hyperpigmentation usually does not present a medical problem, but patients usually complain of dark gums as unaesthetic. This problem is aggravated in patients with a “gummy smile” or excessive gingival display while smiling. Esthetic periodontal plastic surgery is especially rewarding in such individuals with compromised esthetics. A case is reported here on the cosmetic correction of “black gums” and “gummy smile.” Periodontal plastic surgery combining gingival depigmentation and esthetic crown lengthening was performed in a single appointment using scalpel surgical technique. The outline of steps involved in the surgical procedure is demonstrated and a brief review of the various gingival depigmentation techniques is depicted here.

**Keywords:** Gingival pigmentation, gingival depigmentation, gingival hyperpigmentation, periodontal plastic surgical procedures, anterior esthetic crown lengthening, lasers in periodontal surgery

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## Introduction

Melanin pigmentation of the gingiva occur in all races.<sup>1-5</sup> Melanin, a brown pigment, is the most common cause of endogenous pigmentation of gingiva and is the most predominant pigmentation of mucosa.<sup>6-10</sup> Gingival hyperpigmentation is seen as a genetic trait in some populations and is more appropriately termed physiologic or racial gingival pigmentation.<sup>1,2,7</sup>

Melanin hyperpigmentation usually does not present as a medical problem, but patients may complain their black gums are unaesthetic. This problem is aggravated in patients with a “gummy smile” or excessive gingival display while smiling. Gingival depigmentation is a periodontal plastic surgical procedure whereby the gingival hyperpigmentation is removed or reduced by various techniques. The first and foremost indication for depigmentation is patient demand for improved esthetics.

## Gingival Depigmentation Technique

Various depigmentation techniques have been employed with similar results (Table 1). Selection of a technique should be based on clinical experience and individual preferences.

One of the first, and still popular, techniques to be employed was the surgical removal of undesirable pigmentation using scalpels. There is only limited information in the literature on

depigmentation using surgical techniques.<sup>10,11</sup> The procedure essentially involves surgical removal of gingival epithelium along with a layer of the underlying connective tissue and allowing the denuded connective tissue to heal by secondary intention. The new epithelium that forms is devoid of melanin pigmentation.

Laser depigmentation has become widely used recently and is even preferred over scalpel technique by many clinicians. The documented advantages of lasers in periodontal surgery include less bleeding<sup>26</sup> and reduced postoperative pain. Accelerated wound healing with laser use has not been scientifically validated. Negative effects of lasers, especially Nd:YAG and CO<sup>2</sup> lasers, include thermal damage to underlying bone when these lasers are used on thin soft tissue during gingivectomies.<sup>27</sup> Tissue penetration from the laser may cause thermal damage 2 to 4 mm below the surface, causing underlying hard tissue damage.<sup>27</sup> The Erbium: YAG laser has demonstrated the best application of laser use, leaving the least thermal damage. However, there is no scientific evidence to establish that laser depigmentation is superior to scalpel depigmentation. The decision to use a laser should be based on the proven benefits of improved hemostasis keeping in mind the claimed advantage of less postoperative pain with gingivectomy, frenectomy, or other procedures.<sup>28</sup>

Table 1. Different Techniques Employed For Gingival Depigmentation.

<b>I. METHODS AIMED AT REMOVING THE PIGMENT LAYER</b>
<b>A. Surgical methods of depigmentation</b>
a. Scalpel surgical technique <sup>11, 12</sup>
b. Cryosurgery <sup>13, 14, 15, 16</sup>
c. Electro surgery
d. Lasers <sup>17, 18, 19, 20, 21, 22, 23</sup>
• Neodymium: Aluminum-Yttrium-Gamet (Nd:YAG) lasers <sup>18</sup>
• Erbium:YAG (Er:YAG) lasers <sup>19</sup>
• Carbon Dioxide (CO2) lasers <sup>20, 21, 22, 23</sup>
<b>D. Chemical methods of depigmentation using caustic chemicals- This method is not used nowadays</b>
<b>II. METHODS AIMED AT MASKING THE PIGMENTED GINGIVA WITH GRAFTS FROM LESS PIGMENTED AREAS</b>
<b>A. Free Gingival Grafts<sup>24</sup></b>
<b>B. Acellular Dermal Matrix Allografts<sup>25</sup></b>

### Excessive Gingival Display

A conservative display of approximately 2-3 mm of the marginal gingiva is generally considered as part of the ideal esthetic smile. In contrast excessive gingival display can severely compromise the appearance of the individual. Etiology for excessive gingival display includes vertical maxillary excess, gingival hyperplasia, and altered passive eruption. Excessive gingival display due to gingival enlargement or altered passive eruption can be effectively corrected by a gingivectomy procedure, whereas correction of vertical maxillary excess requires more complicated osseous resection surgeries.

### Case Report

This case involves an esthetic anterior crown lengthening along with gingival depigmentation that was completed using the surgical scalpel technique at the same appointment.

A 19-year old female patient reported with the demand for cosmetic correction of “black gums” and “gummy smile” (Figures 1 and 2).

The patient was a South Indian. Physiologic melanin pigmentation is rather common among dark skinned people; usually the degree of gingival melanin pigmentation correlates well to the degree of melanin pigmentation of the skin.<sup>29</sup> However, in this particular patient the degree of gingival pigmentation was much higher when compared to her skin color. Examination revealed she had an excessive display of gingiva attributed to a mild generalized gingival enlargement. The clinical crown was much

shorter than the anatomic crown, and the patient expressed the desire to have “longer teeth” along with correction of hyperpigmentation.

It was proposed to complete an external bevel gingivectomy for crown lengthening and depigmentation of the gingiva in the anterior region alone (premolar to premolar) in both the maxilla and mandible.

### Procedure

A complete medical history and blood investigation was carried out to rule out any systemic contraindication for surgery. Local infiltration anesthesia was given (2 ml of Lignocaine with adrenaline in the ratio 1:100000 by weight).

Crown lengthening by external bevel gingivectomy was completed initially. The cementoenamel junction was determined by careful probing around three points on the labial and lingual surface of each tooth. Pocket marking was done on the external surface of the gingiva corresponding to the cementoenamel junction using pocket markers. The bleeding points on the gingival surface created by the pocket markers were taken as reference points for placing the external bevel incision. The incision was made using a Kirkland knife from the attached gingiva to a level just apical to the pocket markings (Figures 3 to 6).

An Orban interdental knife was used for interproximal incisions and the strip of excess gingival tissue was removed.



**Figure 1.** Intraoral preoperative view demonstrating hyperpigmented gingiva and short clinical crowns of the upper and lower anterior teeth.



**Figure 2.** Preoperative view illustrating excessive gingival display on partial lip separation.



**Figure 3.** External bevel incision placed in the maxillary anterior region using a Kirkland knife.



**Figure 4.** Tissue removed in the maxillary arch using interdental knives.



**Figure 5.** External bevel incision placed in the mandibular anterior region using a Kirkland knife.



**Figure 6.** Tissue removed in the mandibular anterior region using interdental knives.



**Figure 7.** Completed gingivectomy maxillary anterior.



**Figure 8.** Completed gingivectomy mandibular anterior.



**Figure 9.** Post operative view after 3 weeks showing increased crown length and loss of pigmentation in the healed area.



**Figure 10.** Final view. The excessive display and hyperpigmentation of gingival has been successfully corrected.

The gingivectomy was followed by the depigmentation procedure. Using a number 11 scalpel blade, the entire pigmented epithelium along with a thin layer of connective tissue (split thickness flap) was removed. This incision was carried out from the apical level of external bevel incision to the apical end of the attached gingiva (mucogingival junction) up to where the pigmentation extended (Figures 7 and 8).

Hemostasis was obtained with sterile gauze and direct pressure. The surgical wound was protected by a periodontal dressing for the immediate two-week postoperative period. The dressing may also prevent excessive granulation tissue formation during healing. Post operative analgesics and antibiotics were prescribed. Amoxycillin 500 mg thrice daily was prescribed for five days and ibuprofen thrice daily for two days was used as analgesic. The patient was advised to use chlorhexidine mouthwashes for the immediate two weeks postoperative period to aid in plaque control.

The area healed well after two weeks. Pigmentation was absent from the newly

formed epithelium and it appeared red after 3 weeks. Upon final healing, the gingiva appeared pale pink, which was very satisfactory for the patient (Figures 9 and 10).

Crown length was adequate and the patient was referred for orthodontic correction of spacing between these teeth. A one-year follow up period did not demonstrate any tendency towards repigmentation of the gingiva.

### Conclusion

Excessive gingival display and gingival hyperpigmentation are major concerns for a large number of patients. Although several techniques are currently in use, the scalpel technique is still the most widely employed. Lasers and cryosurgery may offer less postoperative pain. Additionally, a surgical soft tissue grafting for depigmentation may ensure less chance for recurrence over a five year follow up.<sup>10, 12</sup> The external bevel gingivectomy combined with the depigmentation procedure described above offers a practical technique to dramatically improve patient esthetics.

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